APPLICATION EXAMPLES

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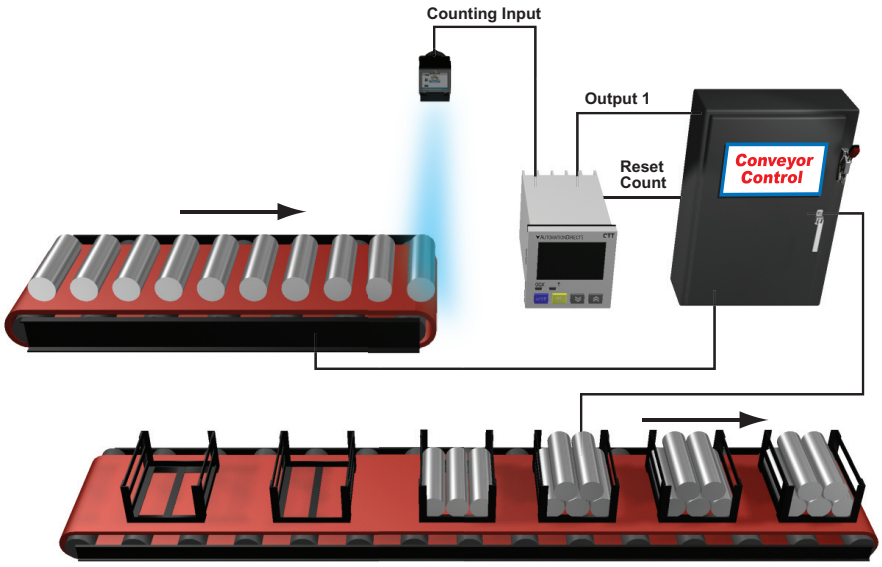
Counter Example 1:

1-Stage Counting (STAGE)

Counting Up (UP)

Using the counter feature of the CTT to count the total number of pieces in a box to signal a conveyor to advance to the next station.



Input Mode

Counting Up (UP)

With the input signal OFF at input CP2, each leading edge of the input signal at CP1 will increment the count present value PV by 1. Turning ON the input signal at CP2 will prohibit the input signal at CP1 from incrementing the PV. Or with the input signal ON at input CP1, each trailing edge of the input signal at CP2 will increment the count present value PV by 1. Turning OFF the input signal at CP1 will prohibit the input signal at CP2 from incrementing the PV.

Output Mode

Mode F (F)

When the count present value PV counts up to the count setting value SV both outputs 1 and 2 will turn ON. The count PV will continue to increment with each input signal. The leading edge of a "reset" input signal at RST1 will turn OFF both outputs, reset the count PV to 0, and prohibit an input signal from incrementing the count PV. The trailing edge of the "reset" signal at RST1 enables counting to begin.

Setting up the parameters in the counter for 1-Stage Counting:

To enter the page for parameter setting of the counter, press MODE for the main menu for more than 3 seconds. After the setup is completed, press MODE for more than 3 seconds under any of the parameter page you are in and return to the main menu.

Select functions: There are 4 modes in CTT, (left to right) timer, counter, tachometer and timer + counter.

MODE

Select counter functions: 1-stage counting, 2-stage counting, batch counting, total counting, dual counting.

MODE

Select input modes: counting up, counting down, counting up/command down, counting up/counting down, quadrature input.

MODE

Select output modes: CTT offer 11 output modes, among which mode S, T and D are only valid with input modes Ud_A, Ud_b and Ud_C.

MODE

Select counting speed: Maximum 10Kcps; others 5K, 1K, 200, 30 and 1cps.

MODE

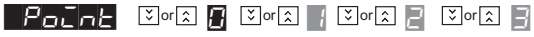
Pulse width of output 1: The default output time is 0.02 second. When the parameter is set to 0.00 second, the output status will be maintained ON.

MODE

Pulse width of output 2: This paramter is adjustable according to different output modes selected. If the output mode is C, the default output time will be 0.02 second, When the parameter is set to 0.00 second, the output status will be maintained ON.

MODE

Set up the position of decimal point: 0 (no decimal point), 1 (one digit after decimal point), 2 (two digits after decimal point), 3 (three digits after decimal point).



MODE

Set up pre-scale value: 1.000 (default 1:1) Range: 0.001 to 99.999

MODE

Save the data while switching off the power: When SAVE is selected, the PV will be saved; when CLEAR is selected, the PV will not be saved.

MODE

Set up minimum width of reset signal: Default = 20ms; 1ms is also selectable

MODE

Select input signal types: NPN and PNP

MODE

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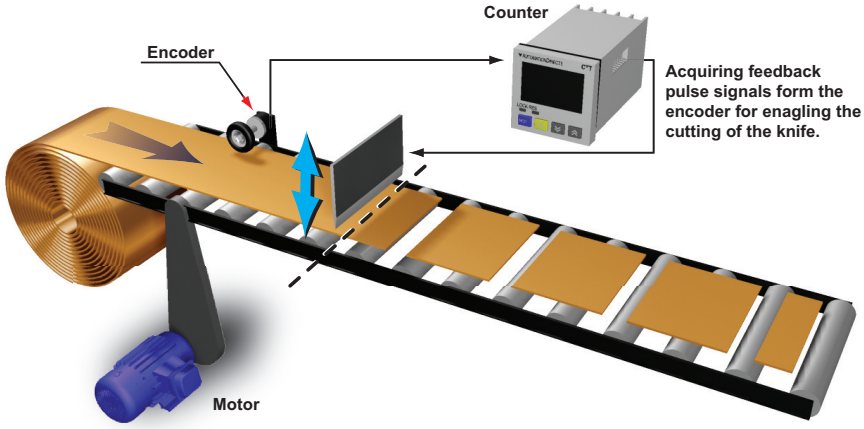
Counter Example 2:

Example of cut to length operation

Using the counter function in CTT and acquires the feedback signal from the encoder for measuring the actual distance traveled by the conveyor. When the set distance is reached, the output signal will enable the knife for the cutting.



Select functions: There are 4 modes in CTT, (left to right) timer, counter, tachometer and timer + counter.

FUnC or tiME or Cont or tACH or nCY

MODE

Select counter functions: 1-stage counting, 2-stage counting, batch counting, total counting, dual counting.

CntFUn or StAGE 1 or StAGE2 or bAtCH or totAL or dUAL

MODE

Select input modes: counting up, counting down, command counting up/down, counting up/counting down, quadrature input.

C inPt or UP or doUn or Ud A or Ud b or Ud C

MODE

Select output modes: CTT offer 11 output modes, among which mode S, T and D are only valid with input modes Ud_A, Ud_b and Ud_C.

C otMd or F or n or C or r or Y or P

MODE

or q or A or S or E or d

MODE

Select counting speed: Maximum 10Kcps; others 5K, 1K, 200, 30 and 1cps.

C SPEd or 10K or 5K or 1K or 200 or 30 or 1

MODE

Pulse width of output 1: The default output time is 0.02 second. When the parameter is set to 0.00 second, the output status will be maintained ON.

t out1 or 002 or 000

MODE

Pulse width of output 2: This paramter is adjustable according to different output modes selected. If the output mode is C, the default output time will be 0.02 second, When the parameter is set to 0.00 second, the output status will be maintained ON.

t out2 or 002 or 000

MODE

Set up the position of decimal point: 0 (no decimal point), 1 (one digit after decimal point), 2 (two digits after decimal point), 3 (three digits after decimal point).

Point or 0 or 1 or 2 or 3

MODE

Set up pre-scale value: 1.000 (default 1:1) Range: 0.001 to 99.999

PSCALE or 1000

MODE

Save the data while switching off the power: When SAVE is selected, the PV will be saved; when CLEAr is selected, the PV will not be saved.

PUErS or CLEAr or SAvE

MODE

Set up minimum width of reset signal: Default = 20ms; 1ms is also selectable

rtSr or 20 or 1

MODE

Select input signal types: NPN and PNP

InPtLC or nPn or PnP

MODE

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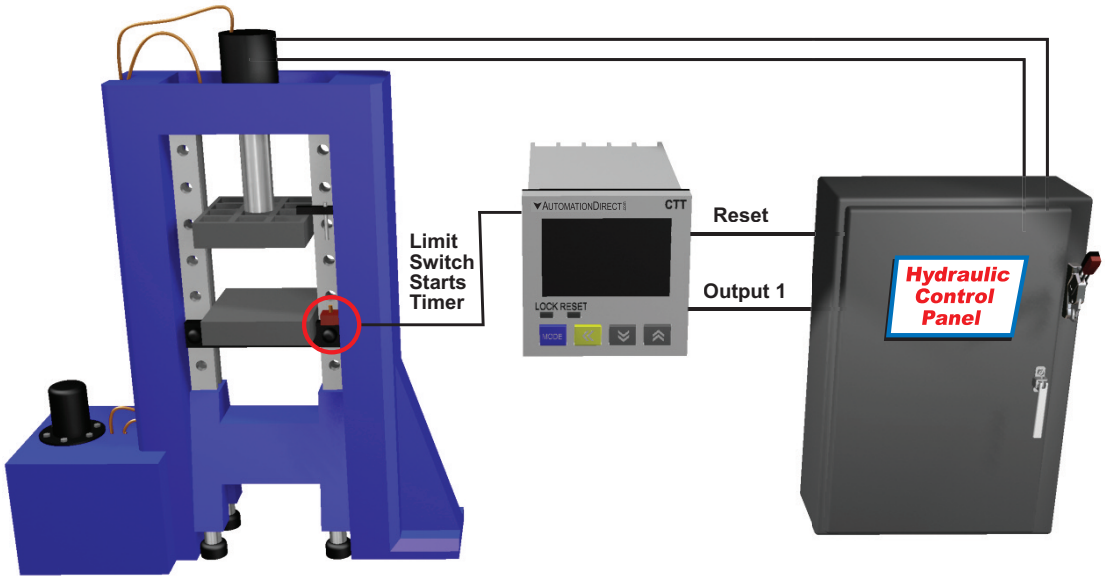
Timer Example:

A basic Timer used to control a clamp time of a compression model press. When the operator signals the mold is loaded with material by pressing the start button the hydraulic cylinder closes the press to make a limit switch which starts the CTT timing. Upon completion of the timer cycle Output 1 is turned on and the press is opened by the hydraulic cylinder.

Signal On Delay 1 (Sond 1)

With power applied to the CTT, the leading edge of an input signal at START will begin the timing period setting value SV timing up or down based on parameter (t modE) or by DIP Switch 2. At the end of the timing period both outputs will turn ON momentarily for the time set in the output pulse width parameter (toUt 1) or will be maintained ON if the output pulse width parameter (toUt 1) is set to 0.00. The trailing edge of the "start" signal has no effect on the outputs or timing period. The leading edge of an "reset" input signal at RST1 will turn OFF the outputs and reset the timing period. The "reset" signal minimum pulse width is set by reset pulse width parameter (rtSr) or DIP Switch 8. The leading edge of an input "pause" signal at GATE will pause the timing period after it has been started. The timing period will continue after the trailing edge of the "pause" (Gate) signal. When power is removed, both outputs will turn OFF and the timing period will be reset.



Setting Timer Parameters

To enter the page for parameter setting of the timer, press MODE in the main menu for more than 3 seconds. After the setup is complete, press MODE for more than 3 seconds under any of the paramter page you are in and return to the main menu.

Select funtions: There are 4 modes in CTT, (left to right) timer, counter, tachometer and timer + counter.

MODE

Select timer mode: timing up and timing down

MODE

Select output modes: There are 12 output modes in the timer. The user can choose the mode that best meets the demand.

MODE

Select display unit: the min. unit 10ms to the max. unit hour are selectable.

MODE

Select pulse width of output 1: The default output time is 0.02 second. When the parameter is set to 0.00 second, the output status will be maintained ON.

MODE

Select min. width of reset signal: The defaul value is 20ms; can be set to 1ms.

MODE

Select input signal types: NPN and PNP.

MODE

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Tach Example 1:

Using PSCALE to convert pulses into engineering units

The PSCALE feature of the CTT is very useful in converting the pulsed signal from an encoder or sensor into some usable unit of measurement.

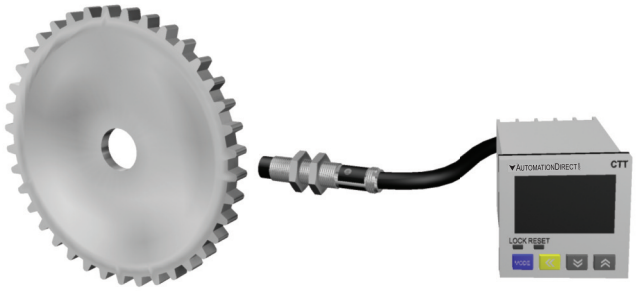
For example if one was to connect a proximity switch to the CTT to monitor the speed of a motor using a sensing gear there is a simple calculation to convert the pulses from the sensor to Motor RPMs.

Using this formula you can calculate a PSCALE value to change a pulse signal into RPMs. First obtain the pulses per revolution (ppr) or number of teeth on the sensing gear for example in the illustration below there are 38 teeth on the gear or 38 ppr. If the gear is coupled directly to the motor this is all that is required to perform the calculation.

PSCALE = 60/ppr or 60/38

PSCALE = 1.579

With the PSCALE set to 1.579 for every 38 input cycles the CTT will display a value of 1.



Keypad set up of the parameters in the Tachometer:

Select functions: There are 4 modes in CTT, (left to right) timer, counter, tachometer and timer + counter.

FUNC or tCnt or Cont or tACH or ACY

MODE

Select output modes: There are 4 output modes, 2Lo1Lo, 2Lo1Hi, 2Hi1Lo, and 2Hi1Hi, For example, when you select 2Hi1Lo, and assume the first set value is 100 (2Hi) and the second 50 (1Lo), the output value of the tachometer will be below 100 (2Hi) and above 50 (1Lo) and CTT will not perform an output. If the set value exceeds the range, CTT will perform an output.

tAoUnd or 2Lo1Lo or 2Lo1Hi or 2Hi1Lo or 2Hi1Hi

MODE

Select rotation speed: Maximum 10Kcps; others 5K, 1K, 200, 30 and 1cps.

C SPEd or 10K or 5K or 1K or 200 or 30 or 1

MODE

Set up the position of decimal point: 0 (no decimal point), 1 (one digit after decimal point), 2 (two digits after decimal point), 3 (three digits after decimal point).

PoInt or 0 or 1 or 2 or 3

MODE

Set up pre-scale value: 1.000 (default 1:1) Range: 0.001 to 99.999

PSCALE or 1000

MODE

Set up the delay time after switching on the power: 0.0 (default). The tachometer will start to run when the set delay time is due after the power is switched on. Setup range: 0.1 to 99.9 seconds

St tAC or 00

MODE

Set up average value of the input filter: The average value is for making the present value detected by the tachometer more stable. The setup range is 0 to 3 (1 = 2 data, 2 = 4 data, 3 = 8 data). For example, if you select "3", the system will average the 8 present values from the tachometer to make the present value displayed on the screen more stable.

St AvG or 0 or 1 or 2 or 3

MODE

Set up minimum width of reset signal: Default = 20ms; 1ms is also selectable.

rtSr or 20 or 1

MODE

Select input signal types: NPN and PNP.

InPtLC or nPn or PnP

MODE

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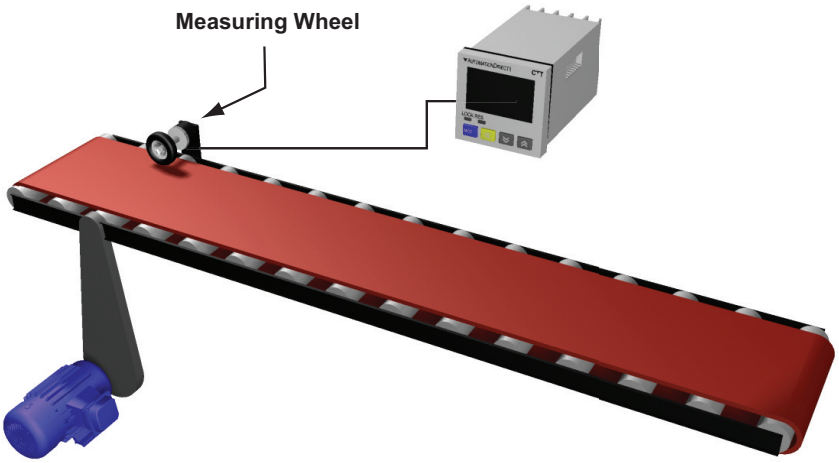
Tach Example 2:

Convert an encoder signal into surface speed of a conveyor.

In order to monitor the speed of a part deliver conveyor belt an encoder with a surface contact measuring wheel is attached to a conveyor where wheel will be in constant contact with the conveyor. Then the PSCALE is set to convert the pulse signal of the encoder into feet/per/minute. Two variables are required, the Encoders pulses per revolution (ppr) the diameter of the measuring wheel. For example when using an AutomationDirect TRD N100 RZWD encoder which has 100 ppr in conjunction with a measuring wheel that is 6 inch in diameter the calculation would be as follows:

Wheel Diameter * or 6*3.1416 or 18.85" in circumference. 1 revolution of the wheel translates to 18.85" of linear motion.

PSCALE = wheel circumference / ppr or 18.85/100 = 0.1885 PSCALE.



Select functions: There are 4 modes in CTT, (left to right) timer, counter, tachometer and timer + counter.

FUnC or tiME or CouNt or tACH or rAtE

MODE

Select output modes: There are 4 output modes, 2Lo1Lo, 2Lo1Hi, 2Hi1Lo, and 2Hi1Hi, For example, when you select 1Hi1Lo, and assume the first set value is 100 (2Hi) and the second 50 (1Lo), the output value of the tachometer will be below 100 (2Hi) and above 50 (1Lo) and CTA will not perform an output. If the set value exceeds the range, CTT will perform an output.

tAotnd or 2Lo 1Lo or 2Lo 1Hi or 2Hi 1Lo or 2Hi 1Hi

MODE

Select rotation speed: Maximum 10Kcps; others 5K, 1K, 200, 30 and 1cps.

C SPEd or 10K or 5K or 1K or 200 or 30 or 1

MODE

Set up the position of decimal point: 0 (no decimal point), 1 (one digit after decimal point), 2 (two digits after decimal point), 3 (three digits after decimal point).

PoInt or 0 or 1 or 2 or 3

MODE

Set up pre-scale value: 1.000 (default 1:1) Range: 0.001 to 99.999

PSCALE or 1000

MODE

Set up the delay time after switching on the power: 0.0 (default). The tachometer will start to run when the set delay time is due after the power is switched on. Setup range: 0.1 to 99.9 seconds

St tAC or 00

MODE

Set up average value of the input filter: The average value is for making the present value detected by the tachometer more stable. The setup range is 0 to 3 (1 = 2 data, 2 = 4 data, 3 = 8 data). For example, if you select 3", the system will averagethe 8 present values from the tachometer to make the present value displayed on the screen more stable.

St AUG or 0 or 1 or 2 or 3

MODE

Set up minimum width of reset signal: Default = 20ms; 1ms is also selectable.

rtSr or 20 or 1

MODE

Select input signal types: NPN and PNP.

InPtt or nPn or PnP

MODE

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